UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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APR 15 2005

Mr. Ken Smith (G-MSO-5)
U. S. Coast Guard and the
Maritime Administration
2100 Second Street, SW, Room 1210
Washington, D.C. 20593-0001

SUBJ: Draft Environmental Impact Statement for the Compass Port LLC Deepwater Port License Application, February 2005 CEQ No. 20050053

Dear Mr. Smith:

Pursuant to Section 309 of the Clean Air Act and Section 102(2)(C) of the National Environmental Policy Act (NEPA), the Environmental Protection Agency (EPA) Region 4 has reviewed the U. S. Coast Guard (USCG) Draft Environmental Impact Statement (DEIS) for the Compass Port LLC (Applicant) document, an evaluation of the environmental consequences of construction/operation of a deepwater port (DWP) off the coast of Alabama. Under Section 309 of the Clean Air Act, EPA is responsible for reviewing and commenting on Federal actions significantly affecting the quality of the environment. In addition, EPA is a cooperating agency for this project. EPA's review of the DEIS includes comments pursuant to both of EPA's roles in this matter.

Functionally, the facility would consist of the means to receive, store, and re-gasify liquefied natural gas (LNG). LNG would be transported to the deepwater port via specialized container ships and then transhipped to a pipeline system, comprising off- and onshore components, which makes a landfall near Coden, Alabama. The Compass Port LLC import terminal will consist of two concrete gravity-based structures fixed to the seabed. Together they contain the integral LNG storage tanks, the LNG re-gasification facilities, operational equipment including mooring/docking/flare platforms. There also will be a separate platform for support facilities, such as personnel quarters and auxiliary structures. The facility will re-vaporize and deliver natural gas at a continuous rate of approximately one billion cubic feet a day. An existing distribution network - with some new construction - will be used to transport the finished gas product to various market users. Construction of the project is forecast to be completed in 2009.

Multiple alternatives were examined in the DEIS: different geographic sites for the port, alternate pipeline on- and offshore routes, fabrication locations, vaporization technologies, seawater intake/discharge designs, and marine life exclusion systems. Application of screening criteria and purpose/need narrowed the range of options to a manageable number and these were

carried forward for further analysis. After evaluation, the array of possibilities was further winnowed. Among this limited set of practicable options is the Applicant's proposal, *i.e.*, location in Mobile Block 910; Compass Port pipeline alignment; use of open rack vaporization (ORV, or "open loop"); technology and port fabrication in Ingleside, Texas. All of these alternatives were compared/contrasted with the no-action option.

EPA recognizes the need to bring additional natural gas supplies into the eastern Gulf region, but has significant concerns regarding the immediate and cumulative adverse impacts in the eastern Gulf waters attendant to the proposed ORV re-gasification technology being proposed for this project. ORV employs a "once through" system to warm the LNG to operating temperatures via heat transferred from ambient Gulf waters. An average of 136 million gallons of seawater per day would be required to heat and re-gasify the LNG. Chilled water would be discharged causing scouring of the sea bottom and attendant turbidity plumes of suspended sediments. Sudden water temperature reductions can be lethal to fish/shellfish eggs and larvae. Chemical biocides, required to prevent the accumulation of fouling organisms on the intake structures and heat exchangers, would be discharged, taking an additional toll on marine life.

Because of the potential immediate and cumulative adverse environmental impacts to eastern Gulf waters and habitat associated with the operation of an "open loop" ORV re-gasification system, EPA has assigned the proposed ORV technology a rating of EO-2, that is, we have Environmental Objections because of the potential for significant environmental degradation that could be corrected by project modification or other feasible alternatives. EPA is requesting additional information be gathered to evaluate/resolve the outstanding issues noted in the attached detailed comments, including alternatives to ORV. This information will be necessary to develop the conditions for the federal Prevention of Significant Deterioration and National Pollutant Discharge Elimination System permits required for this DWP.

In addition to concerns with re-gasification technology, EPA has comments and recommendations on project air quality consequences, cumulative impacts of on- and near shore construction and operations, water quality, entrainment impacts on regional fisheries, evaluation of risk analysis, environmental justice, pipeline construction impacts, population relocations, navigation risks, gas pipeline setback criteria, and horizontal directional drilling alternative(s).

We acknowledge that there are many competing and often conflicting elements associated with the initial construction and, more important, the long-term operation of these DWP facilities. EPA is sensitive to the fact that this project has important national security, energy, and serious economic implications. Because the evaluation process is time constrained, resolution of the outstanding issues on this proposal will receive a high priority. EPA technical staff intends to continue to work with their Coast Guard counterparts through the remainder of the permitting process to secure an environmentally acceptable outcome without unnecessary delays to the Applicant.

Thank you for the opportunity to review/evaluate this documentation. Should you have further questions, Heinz Mueller (404-562-9611/ mueller.heinz@epa.gov) will serve as initial point of contact.

Sincerely,

J. I. Palmer, Jr
Regional Administrator

Enclosure

cc: Ann Klee, General Counsel

DETAILED COMMENTS

On the basis of our initial review we determined that additional data as well as clarification of existing information are necessary to improve the documentation required for satisfactory completion of the final EIS. This new information is essential for informed decision-making as regards whether the applicant's preferred alternative is implemented. The major items for consideration appear as recommendations.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) ISSUES

The Applicant currently proposes using an open loop re-gasification (ORV) technology. This "once-through" system warms the LNG to operating temperatures via heat transferred from the ambient Gulf waters. Specifically, it is comprised of a submersible pump located in each of the six intake structures and will have a maximum design pumping capacity of 30.4 million gallons per day. ORV requires the use of a biocide, in this case sodium hypochlorite, to control bio-fouling of its intake structures and heat exchangers. This material is applied at a continuous rate (at approximately 0.2 mg/l); every eight hours each pump will be shocked with 2.0 mg/l of hypochlorite for 20 minutes. While only one unit will be shocked at a time, this dosage roughly translates to an annual discharge of 130,000 pounds.

An alternative technology to ORV discussed in the application for this project and in the DEIS is submerged combustion vaporization (SCV or "*closed loop*"). SCV re-gasification technology uses a portion of the LNG to fuel the process whereby a portion of the liquified product is heated to operating temperatures for shipment via pipeline. Since the combustion vaporization process is thermally stabilized by submersion in a water bath (i.e. no intake and no discharge), no compression of the natural gas is required. Thus, SCV eliminates the issues associated with discharge impacts including those associated with chilled water, chemical pollution (biocides chlorine and copper, etc.) and turbidity resulting from scouring of the seabed. This technology, when used to address discharges, also will eliminate the impingement and entrainment of aquatic organisms associated with the intake structure. With SCV, the exhaust gases flow directly through a water bath which acts as a quench and abatement system. Since the SCV combustion process relies on a relatively clean fuel, its air quality consequences are primarily associated with oxides of nitrogen and carbon dioxide emissions. Further, SCV is being economically and profitably used today in other parts of the United States (and the world), especially in areas where seawater temperatures are at or below 5°C (ORV becomes impractical because of the possibility of the seawater freezing within the system). SCV is also being proposed for U.S. offshore LNG import terminals including two in California (Cabrillo Port and Crystal Energy) and three in New England (Broad Water, Excererate Energy, and Disti-gas).

While the Application and the DEIS includes SCV, the DEIS does not adequately analyze SCV as an alternative technology. Because EPA has not promulgated effluent guidelines for LNG facilities, the NPDES permit issued by EPA would include technology-based discharge standards that represent the "best available technology economically achievable" (BAT) level developed on a case-by-case basis using EPA's best professional judgment (BPJ). EPA

regulations set forth a number of factors that must be considered when developing BAT-based discharge limits and these include the: (i) age of equipment and facilities involved; (ii) process employed; (iii) engineering aspects of the application of various types of control techniques; (iv) process changes; (v) cost of achieving such effluent reduction; and (vi) non-water quality environmental impact (including energy requirements). See 40 C.F.R. § 125.3(d)(3). Development of the permit also will require considerations of the discharge on the marine environment under CWA sections 316(a), which addresses the thermal component of discharges, and 403, which requires evaluation of the effect of a discharge on the marine environment. Also, because the tankers, when berthed with the facility, use and discharge cooling water, EPA will also consider during the permitting process the extent to which section 316(b) may be applicable. Given the expedited nature of permitting, we require information detailing whether vessels' cooling water use and discharge will increase in volume and/or velocity when at berth during re-gasification (compared to use and discharge while underway).

In order for EPA to perform the BAT analysis (as well as analyses required under CWA sections 316(a), 316(b), and 403) for developing the discharge limits in the NPDES permit, additional comparative analysis of the ORV and SCV technology alternatives will need to be provided in the EIS. At a minimum, the following information should be fully detailed in the EIS pursuant to NEPA and CAA Section 309:

1. Thermal impacts on the organisms at the point of discharge and after mixing from the use of ORV technology.

2. Use of copper as a biocide for the screens with ORV, including but not limited to its impact on organisms at the point of discharge and after mixing.

3. Volume and nature of the discharge from the DWP with respect to cooling water used by the tankers while berthed for both re-gasification technologies (ORV and SCV).

4. Capital and operating costs associated with redesigning the ORV system to eliminate currently identified environmental impacts of ORV re-gasification technology.

5. An analysis of the reduction of water pollution/increase in air pollution associated with the use of SCV technology.

6. Incremental compliance cost of change from ORV to SCV.

In addition to the above information, in order to perform its BAT analysis EPA will need to construct a cash flow model to estimate the potential economic impact (pre-tax) of the various vaporization technology annualized costs on the LNG import terminal. To perform that analysis,

EPA will need the following input parameters for the implementation of both ORV and SCV at the LNG terminal:

1. Projected average annual revenue.
2. Projected price of natural gas at delivery to U.S. market.
3. Detailed projected capital and operating costs.
4. Projected sales, general, and administrative (SG&A) costs.
5. Projected depreciation expenses.
6. Interest paid out for the LNG import terminal project.

RECOMMENDATIONS: **Additional documentation for both the EIS alternatives analysis and subsequent NPDES permit is required to evaluate the best available technology economically achievable as well as the impacts of the discharge on the marine environment. To finalize the permitting process, more detailed engineering and economic information on the various re-gasification options will have to be obtained from the Applicant. Completion of the comparative analysis between ORV and SCV will need the expected initial investment cost of the DWP as well as the financial projections the Applicant used.**

Subject matter contact: Ms. Karrie-Jo Shell (404) 562-9308

AIR QUALITY CONSEQUENCES

The draft EIS indicates (See Pg. 4-68, Section 4.2.1.8) that "for the purposes of this evaluation, the USCG and MARAD would defer to the USEPA to determine significance through the permit process. As a result, significance and approval of the License would be conditional on the Applicant's ability to obtain and comply with any applicable air permits." This is not an accurate characterization of the process. It is correct that the Deepwater Port Act conditions an authorizing license upon the applicant's ability to obtain/comply with any applicable air permits. However, the statement that significance is determined through the permitting process is inaccurate. Specifically, it mis-characterizes the relationship between a determination of significance under NEPA compared to same within the context of the air quality permitting process under the Clean Air Act. The air quality assessment of environmental impacts as part of the NEPA review process is comprehensive and not limited to the analysis required to obtain air quality permits.

The discussion of the liquified natural gas carriers (LNGCs) (e.g., Section 4.2.1.8.3, Operations Impacts/Other Considerations) does not correctly describe the propulsion systems found within the current LNGC fleet. During coordination meetings with the applicant, EPA learned Compass Port intended to contract with and accept cargo from the existing fleet of international carriers. Many of these LNGCs are powered by boilers and steam turbine driven generators that use bunker C fuel when offloading cargo. The emission projections from such units differ markedly from those of the diesel-driven LNGCs presented in the draft EIS.

More quantitative data should be included in the draft EIS to ascertain the impacts of some specific air quality issues as well as the cumulative air quality effects of this proposal. The only quantitative air quality impact modeling (See Section 4.2.1.8.3- Dispersion Modeling Results) provided in the draft EIS was relatively cursory in nature, *i.e.*, a description of the modeling study without any associated details or modeling input/output information. Further, there were no quantitative ambient air quality impact assessments and/or modeling for the operations and construction of the off/onshore pipelines and onshore fabrication facilities.

The cumulative impact sections of the draft EIS would be improved by additional quantitative assessments of potential air quality impacts. This is in contrast to the applicant's earlier 2004 environmental assessment in which the air quality modeling was included in the license application for the permit. With the exception of the operations of the deepwater port and offshore pipeline, only un-demonstrated conclusions were provided that the project's emissions in concert with the cumulative emissions from other area sources will cause insignificant impacts.

The following advice is provided to assist the applicant in improving the content of the EIA and developing the necessary informational framework to conduct the ambient impact dispersion modeling. Comments are appropriate for both the *OCD* and *CALPUFF* models.

1. Complete documentation of the evaluation of air quality impacts would include more detailed information on specific methods/procedures which were used as well as input/output modeling files. This more detailed ambient air impact information could be included in the Volume 2 - Appendices.

2. The closest receptor point appears to be 5 km distant from the proposed DWP. To provide a complete ambient air impact assessment, over-water receptors in ambient air between the DWP exclusion area and 5 km should have been included in the modeling design.

3. The emissions which were used to estimate post-project concentrations were limited to those generated from the proposed re-gasification facility. A modeling analysis which included other off/onshore emission sources would have provided a basis for a more appropriate comparison with national ambient air quality standards (Table 4.2.1-14). Inclusion of all emission sources (appropriate on-

and offshore) could have a significant influence on the modeling results and, in turn, the overall significance of the project's air quality impacts.

4. The text indicates that the proposed project would "emit less that 250 TPY of each criteria pollutant". However, Tables 4.2.1-12 and 13 estimate that total project emissions will be greater than 250 TPY for some of these same pollutants. The distinction(s) between total project and PSD applicable emission sources will need to be clarified.

5. While the text indicates the project will have no impact on the Breton Wildlife Area (BWA), this conclusion is at variance with the information observed in Table 4.2.1.15. It appears that the estimated change in visibility is larger than BWA's acceptable visibility limits.

6. The draft EIS is limited to solely qualitative assessments of air impacts accruing from offshore pipeline and DWP construction. These assessments are questionable in that they were obtained by adjusting operational port modeled impacts by the expected emissions from the pipeline and port construction. Because the modeling on which this assessment was based did not include all appropriate ambient air over-water receptors or account for the different emission characteristics of the sources, the offshore pipeline and port construction impact results are not supported by the necessary and appropriate impact assessment techniques. Therefore the conclusion that subject construction activities will have slight, if any, adverse air quality impacts remains to be determined.

7. The background air quality monitoring information in the project affected areas needs revision. The tables of measured air quality for the areas of concern should contain values associated with each NAAQS pollutant and its averaging period. The tables omitted 24-hour PM10 and PM2.5 values as well as those for 3-hour SO_2. Values for CO were omitted from all tables and not included in the modeling analyses. When existing monitoring data are not available, representative values should be provided when possible.

8. The draft EIS indicated (Section 4.0) that two air quality evaluation criteria were used in the analysis of air quality impacts accruing from this project, i.e., NAAQS compliance and substantial impact to sensitive receptors. However, the environmental impacts sections did not present any conclusions for these criteria from this analysis. Further, the sensitive receptors, if any, should have been identified. An assessment of air quality effects on these receptors, e.g., visibility, deposition, etc., should be discussed in the final EIS as well as a discussion of the project's NAAQS compliance.

9. Most of the emission estimates provided in the draft EIS reflect the expected annual emissions associated with the operation/construction of the DWP and associated pipeline system. Short-term hourly emissions are only provided in Table 4.2.2-14a and were

indicated to be the values used in the dispersion modeling for the DWP operation. Short-term emission rates - when converted to annual rates - should be greater or equal to the annual values. However, some of the short-term emission rates when converted to annual rates are less than the annual values reported (See Tables 4.2.1-12/13). The reason(s) for these unexpected hourly emission rates should be clarified in the final EIS.

10. The cumulative impact evaluation was limited to analyses of other DWP in the Gulf of Mexico, off- and onshore pipelines within five and twenty-five miles of the Compass Port and Compass Pass DWP, respectively, and to the fabrication facilities in the vicinity of Ingleside, Texas. To develop a more appropriate appraisal of the cumulative air quality effects, other on- and offshore non-DWP significant sources should be included in the final EIS.

RECOMMENDATIONS: The final EIS needs to clarify that the air quality assessment of the project's environmental impacts is comprehensive, and not limited to the analysis required to obtain air quality permits. The differing environmental ramifications resulting from air emissions of a tanker fleet using diesel versus bunker C need to be assessed in the final EIS. Appropriate supporting evidence/bases for the conclusion that the DWP will have nominal adverse air quality consequences will have to be provided to complete the EIS and allow adequate evaluation by reviewers of the air permit.

Subject matter contacts: Mr. Stan Krivo 404 562-9123 and Ms. Kelly Fortin 404 562-9117

CUMULATIVE IMPACTS

A comprehensive approach should be employed for analyzing a project of this nature. That is, all of its effects should be examined in composite, *i.e.*, the impacts of the offshore terminal facility, the associated pipelines, and the onshore fabrication site, as well as the onshore receiving facilities, rather than segmenting the analyses. From this perspective, there are some important elements, such as existing facilities and their operational inputs, of a thorough cumulative impact analysis which remain to be addressed by the applicant. For example, new pipelines (on- and off-shore) that will have to be constructed to service new Gulf LNG terminals. No mention was made of them in Table 6-5, page 6-20. This transport system could have important environmental consequences and is essential to operation of the DWP facilities; hence, its extent/significance should be examined in the final EIS.

Further, the cumulative impacts analysis was limited to seven projects. We understand that there are various proposals for additional fabrication sites along the La Quinta Channel and Harbor Island areas of Corpus Christi Bay. These should have been included. Moreover, the impacts of using the Kiewit site along the La Quinta Channel of Corpus Christi Bay for two LNG terminal construction projects, for instance, the ConocoPhillips' Compass and Beacon Ports, warrant investigation. This information is already available for the Beacon Port

Deepwater Port License Application, so an overview could be provided in the final EIS.

Moreover, the list of projects considered for cumulative effects analyses (See Pg. ES-22 & 6-22 to 6-26) did not include the Exxon Mobil Pearl Crossing fabrication site. Two alternative fabrication sites have been proposed along the La Quinta Channel, including the preferred site for the Compass Port fabrication facility, as well as two alternative sites on nearby Harbor Island. The reason(s) why they were not included, together with their potential environmental consequences, should be detailed in the final EIS.

The Beacon Port information describes a fabrication plan in which four GBS units would be constructed. Beacon and Compass Port will each have two, arrayed front-to-back in adjoining casting basins, but with a shared excavated tow-out basin. This arrangement appears to call for an additional 51 acres of land for temporary storage of soil excavated from the larger combined fabrication site and for 1,440,000 cubic yards of additional dredging beyond that required for the Compass Port fabrication site alone. Since these two facilities are proposed for the same site, by the same company, for similar LNG projects, and will occur within one year of each other, combined fabrication is a reasonably foreseeable election. There may be ecological impacts and benefits from this arrangement which would differ if two different fabrication sites were to be selected. In fact, the ecological benefits might be significant. This aspect of the applicant's overall proposal should, therefore, be fully disclosed in the final EIS and in subsequent permit documents for both LNG terminal proposals.

The cumulative effects chapter primarily focused on impacts arising from other LNG facilities and related OCS activities. There are other proximate activities, *e.g.*, dredged material disposal operations which merit consideration. EPA has an Ocean Dredged Material Disposal Site (ODMDS) just to the north of the preferred alternative location which may be enlarged. The Corps of Engineers has also utilized one or two other disposal areas in the vicinity. Potential cumulative impacts of these activities, both benthic and water quality effects, remain un-assessed. In addition, there are a number of federally permitted artificial reef areas in the area which justify attention in terms of potential adverse impacts accruing from the discharges attendant to LNG operations.

We have also expressed concerns with regard to the onshore impacts to coastal wetlands caused by the pipeline components near Coden, Alabama (See attached June 21, 2004 letter from Ronald Mikulak, Chief of the Region 4 Wetlands Regulatory Section, to Colonel Robert B. Keyser).

RECOMMENDATIONS: **The final EIS would be improved by addressing impacts from all reasonably foreseeable activities in the geographic area which could influence the overall cumulative impacts of this proposal.**

Subject matter contacts: Ms. Barbara Keeler 214 665-6698 and Mr. Chris McArthur 404 562-9391

NEAR/ONSHORE EFFECTS

Seagrass beds occur immediately upstream, downstream, and across the La Quinta channel from the proposed Kiewit fabrication site. A key project management consideration will be whether these biologically sensitive communities will be unacceptably stressed by this DWP fabrication. There are concerns about the short- and long-term effects (i.e., increases in suspended solids and resulting turbidity from channel bottom work) attendant to opening the bund wall to tow out the Beacon Port GBS just a year after opening the same wall for transport of the Compass Port GBS. These perturbations to the seagrass communities are in addition to the shoreline dredging planned for onshore LNG terminals along the La Quinta Channel.

Considering the sensitivity of seagrass beds to alterations in salinity and turbidity, we also recommend that a seagrass expert be consulted about the timing and location within the waterbody of the hydrostatic test water discharge. A protocol will need to be developed which would minimize adverse consequences of these hydrostatic test water discharges. If there are functional losses associated with this action, mitigation to achieve a no net loss goal will be necessary.

There are lists of various mitigation measures which FERC requires or recommends (ref: Sections 4.2 and 4.3). The final EIS should clarify who, where, and when these commitments will be honored and these stipulations should be codified in the Record of Decision for the project. In a related matter, receipt of germane materials as soon as they are available will expedite review of the Clean Water Act Section 404 permit application.

Additional EPA comments related to near/onshore impacts as a result of pipeline construction for the Compass Port project are included in EPA's letter dated June 21, 2004, to the U.S. Army Corps of Engineers (See Appendix A-5 of the DEIS.), and are hereby incorporated by reference as if set forth fully herein.

RECOMMENDATIONS: The wetlands and dredging impacts sections of the final EIS would be improved by a description of how the dredging associated with the Conoco-Phillips Compass Port and Beacon Port fabrications (e.g., Kiewit site) will be coordinated to lessen wetlands' impacts. Considering the sensitivity of seagrass beds to alterations in salinity and turbidity, we recommend that a seagrass expert be consulted about timing and location within the water body of the hydrostatic test water discharges. The results of this matter should be incorporated into the final EIS. In view of the potential adverse impacts to these species and their physical environment, the proposed avoidance and mitigation plan will have to be completed prior to issuing the license or the license to construct should be conditioned to include a plan which is agreeable to state/federal regulatory/resource agencies. Unnecessary delays can be avoided if the specifics, or at

least a range of possibilities, of this plan were provided in the final EIS. In a related matter, the comprehensive dredging plan for this proposal should be available in the final EIS in order to assure stakeholders that the impacts to submerged aquatic vegetation resources are avoided to the maximum extent possible and, where not avoided, fully mitigated.

Subject matter contact: Ms. Barbara Keeler (214) 665-6698 and Mr. Ted Bisterfeld (404) 562-9621.

WATER QUALITY CONSIDERATIONS

Plume impingement erosion (See Pg. 4-12 and Appendix F, Pg. F30-32) should be viewed as a significant long-term, adverse water quality impact. Open Rack Vaporization (ORV) discharges could result in the production of a sediment cloud extending 5 miles from the facility with a total concentration approaching 9,000 mg/l. This perturbation results from two phenomena: 1) the induced velocity of the plume vertically impacting the bottom; and 2) the induced velocity of the plume lying parallel to the bottom. Vertical velocity effects could result in a scour hole 60 feet in diameter and 18 feet deep for each discharge port without adequate protection/mitigation. We acknowledge that this bathymetry impact would take approximately 25 years to develop completely, but this is a significant alteration to the present bottom profile. The re-suspension rate due to the plume moving parallel to the sea bottom would be approximately 4 times greater than non-project conditions without plume impingement. The macro-approach used to make these calculations only provides a very rough estimate of the geographic scope of impacts under higher current velocities the distance involved would be even greater. The use of ORV technology on the project's impacts needs to be further refined to provide greater certitude of consequences in terms of degree/kind. The data and subsequent conclusions drawn therefrom should be detailed in the final EIS.

The draft EIS noted that discharge erosion impacts will be mitigated by using rip-rap or similar protective materials within the zone of greatest anticipated impact. Annual monitoring of the sea bottom bathymetry and quarterly monitoring of suspended sediment concentrations would then be conducted to determine the efficacy of this mitigation approach. EPA suggests the following recommendations be examined in the final EIS both to address/mitigate some of the adverse consequences of scouring effect and secure the requisite water quality permit to commence construction:

1. Because a 9,000mg/l turbidity plume could have a considerable impact on water quality, the significance of the predicted suspended sediment concentrations should be assessed. A sensitivity analysis should be conducted of the results using various discharge flow rates and ambient current velocities/directions. Advection, dispersion, diffusion, and settling of the resulting discharge plume should be modeled to provide an estimate of the plume width and concentration as a function of distance from the

discharge points. A better assessment of the potential impact of the turbidity plume could then be made.

2. An estimate of the areal coverage needed for the mitigation rip-rap or other protective materials should be provided. In this regard, there is a confusing sentence in the second paragraph of this section on page 4-12 regarding thermal discharge simulations. Specifically, it is unclear from the text if the simulations have been done or will be done. If they have been done, the results should be provided. If not, they should be accomplished and the results made available to stakeholders.

3. Alternative discharge port configurations (e.g., a vertical discharge) should be considered that may lessen the lateral shear stress producing the turbidity plume.

4. The mitigation plan needs to be improved, especially regarding its monitoring protocol. For example, monitoring is necessary irrespective of whether protective materials are used. When protective materials are used, monitoring should be conducted to determine the effectiveness of the material, and validate its design. Further, monitoring should be conducted more frequently than quarterly, at least initially, to determine the turbidity plume's variability, magnitude, and most important environmental consequences. To reach sound conclusions regarding the latter issue, pre-project background conditions should be established over a variety of sea state conditions to determine the natural variability of suspended sediment concentrations at the DWP's proposed location. Success measurements for lessening turbidity/erosion should be offered for consideration in the Record of Decision.

The extent of thermal discharge impacts (See Pg. 4-4, Line 19) depends upon the rate of the ORV discharge. However, only the maximum rate of discharge was modeled. Modeling results for average and below average discharge rates as well as different discharge configurations (*e.g.*, altering the number of discharge ports operating) should have been provided. The draft EIS states that adequate discharge blending within the mixing zone is dependent upon maintaining a velocity of approximately 10ft/sec at the diffuser discharge ports. However, this will only be the case with all ports operating at the maximum discharge rate. Information on the dilution rates achieved for different port operating configurations at different discharge rates will be needed in order to develop appropriate operating NPDES permit conditions.

Representative current speeds of 0.33 and 0.66 ft/sec were used to develop the suspended sediment concentration estimates resulting from pipeline installation. However, for the thermal discharge evaluation, velocities of 0.33, 0.82, and 1.64 ft/sec were used to examine potential effects. These higher representative velocities should be considered in the analysis of the pipeline's installation turbidity plumes. As water quality impacts could be significant, we recommend using a model such as the Corps of Engineers Sediment Resuspension and Contamination Release by Dredge model,"DREDGE", (available at: www.wes.army.mil/el/elmodel) to estimate the downstream concentration under various current

velocity scenarios.

Conversely, data from the Chevron Destin Dome circulation monitoring report indicates that velocities down around 2 cm/sec or .07 ft/sec are quite common within the GOM. Hence the current regime is not a simple phenomenon to evaluate and/or characterize.

If contaminated sediments are identified during subsequent investigations by the applicant, EPA requests notification of same.

RECOMMENDATIONS: Plume impingement (induced turbidity plumes) requires further analysis including an assessment of the dispersion rates of the plumes and additional analysis of alternatives for reducing the magnitude of such plumes. In addition, mitigation plans should be more fully developed and monitoring plans improved. Information on the dilution rates achieved for different port operating configurations at different discharge rates will be needed in order to develop appropriate operating NPDES permit conditions. Higher current velocities need to be evaluated in assessing the turbidity plumes resulting from pipeline installation. In addition, the dispersion and advections of these plumes require further assessment.

Subject matter contact: Mr. Chris McArthur 404-562-9391

ENTRAINMENT IMPACTS ON REGIONAL FISHERIES

One of the significant impacts of the proposed DWP operation appears to be the destruction of fish eggs and larvae caused by entrainment in its ORV unit. Invertebrates (eggs/larvae) would also be entrained by the ORV intakes and meet the same fate as fish species. Calculations provided from SEAMAP data indicate that about 2.6 million fish eggs and 3.7 million fish larvae would be destroyed each day (see p. 4-50, lines 37-39 of the DEIS). These calculations result in base estimates of annual *Age-1* equivalent fish losses (from entrained eggs) of 82,336 – 1,839,172, depending on variation in the natural mortality of various life histories etc., (see p. 4-51, lines 20-22 of the DIES). Impacts (due to entrainment) are ultimately expressed as equivalent yields (lbs) of later adult stages of groups of fishes caught in commercial and recreational venues. Estimated yields are then compared to Gulf of Mexico (GOM) catch data. As would be expected using this premise, adult equivalents impacted by the ORV unit comprise a small percentage of the annual GOM catch. EPA is concerned about how this result was achieved and the conclusions presented in the DEIS, and these concerns are set forth below.

As noted in the DEIS, the northern GOM (east of the Mississippi River) is dominated by cyclonic circulation patterns (see pp. 3-12 and 3-13 of the DEIS). Germane to this proposal, the Loop Current and its associated gyres do not significantly intrude on local circulation patterns in the vicinity of the proposed DWP. Hence, eggs and larvae produced by spawning on the Mississippi (MS) and Alabama (AL) shelf and adjacent waters are not distributed throughout the

GOM. Rather, they recruit back to the MS - AL shelf via regional entrainment in localized cyclonic circulation patterns. Reciprocally, recruitment of juvenile fishes produced from other geographic areas of the Gulf (LA and TX) back to the MS-AL shelf is also limited by entrainment in local circulation patterns. It is reasonable to expect, therefore, that the DWP's fishery impacts will be localized with effects experienced mainly by the existing MS-AL shelf fish stocks. Given these circulation conditions, the Applicant should estimate marine fisheries impacts to MS, AL, and the panhandle of Florida.

Commercial fishery landings (by weight) for the GOM, AL, and MS are presented in the table below. While the total and state landings are variable over the two years, it can be assumed that most or all of the commercial catch occurred on or very near to the Al and MS shelf and adjacent waters.

Commercial fishery landings in the GOM, MS and AL, 2002 and 2003 (National Marine Fisheries Service) .

	2002 Thousand Pounds	**2003** Thousand Pounds
Gulf of Mexico	**1,716,140**	**1,600,481**
Alabama	23,380	25,344
Mississippi	217,053	213,116
AL/MS Combined	240,433	238,460

1 http://www.st.nmfs.gov/st1/fus/fus03/02_commercial2003.pd.

The percentages of AL and MS commercial landings (by weight) of total Gulf landings for 2002 and 2003 are presented in the table below. We can assume that the AL and MS proportions of the Gulf totals (as a function of numbers of individuals) are roughly the same as the proportion of the catch by weight.

AL and MS commercial fishery landings as a percentage of GOM totals.

	2002	**2003**
Alabama	1.4	1.6
Mississippi	12.6	13.3
AL and MS Combined	14.0	14.9

It can be seen that the commercial catch on the MS and AL coasts represents a highly variable, but small (< 15% combined) percentage of the total GOM catch.

The number of 1-year animals entrained by the ORV unit intakes remains fixed so its percentage of the adjusted regional total catch of the MS/AL shelf increases proportionately. If the AL and MS fishery is approximately 15% of the total GOM fishery, all fishery impacts discussed in the DEIS should be considered in light of the regional impacts, in addition to the Gulf-wide impacts.

Equivalent Yield estimates are defined as: "the number of adult fish that would be removed from the populations that would otherwise have survived to a size necessary for recreational or commercial fishery catches." Many (but not all) managed marine species have, by federal and state regulation, minimum size (length of individual) restrictions for harvest for both recreational and commercial fisheries. The size limits are based on the knowledge that smaller sexually mature adults will have several years to spawn prior to their entry into the harvest. These animals provide the brood stock needed to sustain fish populations and maintain harvest at pre-determined levels. The ORV unit, unlike the managed fishery harvest, takes the adult equivalents out of the population before they have had the opportunity to grow to sexual maturity and spawn, thereby removing potential recruits to adult populations. In this instance, the population effects (due to the loss of sexually mature adults) are compounded over time, especially in locally over exploited fish stocks. The Applicant should provide an analysis of the effects of potential brood stock loss to fish populations and long term effects of such loss on fisheries.

A significant proportion of the natural mortality of commercially important ichtyoplankton is due to predation by planktivorous animals, including other commercially valuable organisms. Eggs and yolk sac larvae have high lipid/protein content and form a highly nutritious component of the latter's diet. In addition, many millions more phytoplankton and planktonic invertebrates (having little/ no direct economic importance) will be entrained by the ORV unit each day. The ecology of the MS-AL shelf largely depends on primary and secondary production in the plankton communities and needs more exposition in the final EIS.

RECOMMENDATIONS: The final EIS would be improved by an assessment of recent literature regarding egg and/or larval transport on the MS-AL shelf and recruitment of same back to MS-AL fish stocks. The ramifications to the ecology of the MS-AL shelf of removing millions of phytoplankton and zooplankton (including about 6 million fish eggs and larvae), from the water column each day needs to be analyzed/discussed in more detail in the final EIS. In turn, this information would be used to resolve just how significant the use of an ORV design will be on the fisheries in the project area. The loss of potential spawning adults of sizes smaller than those entered into the fishery harvest also needs to be analyzed/discussed more throughly. There is a reasonable possibility that this loss may, in time, have greater economic impacts than the annual fishery loss cited in the draft EIS.

Subject matter contact: Dr. Roland Ferry (404) 562-9387 and Mr. Ted Bisterfeld (404) 562-9621.

EVALUATION OF RISK ANALYSIS

The generic hazards/safety considerations of LNG operations, including modeling of potential releases specific to the Compass Port facility, are presented in a safety and risk assessment. The risk assessment was limited to a hazard analysis/modeling of limited LNG releases, that is, not

more than 25,000 cubic meters/10 minutes in duration, from the facility or its product carriers. Modeling of the noted combustion projected a burn-range of less than 2 miles. The facility is being designed to store 300,000 cubic meters of LNG.

The discussion of potential threats to the DWP facility from severe weather such as hurricanes was deemed to be minimal, notwithstanding the fact that storm activity in the Gulf is projected to increase in the near future. The analysis should include hazards of hurricane disturbances as "credible scenarios." Evidence has shown that offshore rigs, wells, and equipment stationed in the gulf have been damaged during these events. The consequences of Hurricane Ivan speak to the concerns in this regard. The subject DWP facility will be located within the effect area of this storm. Ivan destroyed and damaged several off shore drilling rigs. One facility was found adrift 70 miles from its original moorings. NOAA recorded 52 foot waves, the maximum wave height recordable by its instruments. In 1992, Hurricane Andrew damaged 87 off shore platforms and rigs in one 48-hour period according to an industry journal. In both storms there were reports of many off shore facilities losing power and communications. There is a concern that some of the approximately 3,000 off shore facilities in the Gulf of Mexico could pose a threat to the Compass Port facility and its LNG storage tanks via physical impact. There is the possibility the tanks could be breached or at least compromised to the extent that their mechanical integrity would be threatened. This possibility needs to be examined further in the final EIS.

In addition, the release scenario modeling needs to include "Computational Fluid Dynamics" (CDF). This modeling incorporate additional factors, such as effects of heat transfer, chemical reaction, dilution (with air), turbulence, geometry, wave heights, etc. that would better characterize the risk from releases and impacts due to hurricane and storm conditions.

RECOMMENDATIONS: The final EIS should include: analyses of "credible scenarios"; additional information about the approach the facility designers used to perform the risk analysis; why the analysis was considered valid for the proposed facility; and how the analysis was incorporated into facility design, operations, and emergency planning.

Subject matter contact: Ms. Ellen Rouch 404 562-9575

ENVIRONMENTAL JUSTICE

The DEIS indicates that "there is no evidence that the proposed project would result in a disproportionately high and adverse human health or environmental effects on minority and low-income populations." This may be true, but the brief discussion (See Section 4.3.1.6.5, Environmental Justice Impacts (EJ)) does not substantiate this proposition nor does it meet the intent of Executive Order 12898. To address this issue there should be a discussion of the nature and quantity of emissions; the limited duration of exposure; the impact of these emissions at any single location, etc. A map showing the location of the construction with respect to

identified groups could also be used to demonstrate compliance with the Executive Order.

Similarly, there is no analysis by minority/income status of those residents which will be most affected by the construction/operation of the onshore pipeline. In Section 4.3.1.9.2, which includes noise impacts from onshore pipeline construction, the closest sensitive noise receptor is mentioned to be 250 feet distant, but the type of receptor is not defined and there is no tally of all sensitive noise receptors and the level of potential noise impact. A range of noise level is presented for some generic construction equipment, but the type of specialized equipment required for pipeline ditching/laying should be known by the applicant, and the levels of noise they produce should be quantified. It should be noted that an elevation of 10 decibels is a substantial impact. Further, there is no mention of whether or not there would be residential or business displacements due to the onshore pipeline component of this project.

RECOMMENDATIONS: **At a minimum, the final EIS should include some quantitative basis for the findings in the EJ narrative (*e.*g., how the nature and location of the air emissions are related to the exposed population, noise impacts, and necessary relocations).**

Subject matter contact: Ms. Kelly Fortin 404 562-9117 and Mr. Ted Bisterfeld 404 562- 9621

MISCELLANEOUS ISSUES

The final EIS should clarify/address the following shortcomings of the alternatives analysis in the draft document.

It was stated that siting the DWP facility more distant from a fairway would pose a greater navigation safety risk as LNG tankers would be moving through uncontrolled waters. This seems to discount the greater risks of DWP-ship collisions given the greater concentration of the latter near fairways. **The proposed location should be justified in this regard.**

The setback requirement for LNG terminals from potential ignition sources is a siting consideration which should have been examined in greater detail in the draft EIS. The applicant's preferred port site is just .5 mile from the Gulfstream 200 gas pipeline. **The need for the setback criteria should be discussed, and an explanation of why they are not applicable in this instance should be provided.**

For any site to be selected for this or other DWP, a 1000 meter setback from four Areas of Biological Concern (ABC) must be observed. The ABC were designated in 1997 by EPA pursuant to the implementation of the NPDES General Permit for offshore oil and gas extraction. The Pinnacle Trends, designated by MMS, and three other features are defined as ABCs within the MMS Central Planning Area that is under EPA Region 4 NPDES jurisdiction. A new General Permit GMG460000 for offshore oil and gas operations was recently issued maintaining these setback requirements. The three ABC features that are potentially relevant to

the Compass Port/Pass project are: Southwest Rock, located at 30° 06.1' North and 88° 12.3' West; the Southeast Banks, located at 30° 0.9 ' North and 87° 57.1' West; and the 17 Fathom Hole, located at 29° 55.6' North and 88° 03.4' West.

The presence of existing natural gas pipeline infrastructure is mentioned as a criterion for DWP siting. However, in this instance the applicant's preferred alternative is to install a new pipeline to shore. It is unclear from the text whether the applicant attempted to identify other pipelines that carry OCS-produced, market-ready dry gas (in addition to the two Gulfstream pipelines). Such pipelines do, in fact, exist within the Central Planning Area. Based on the discussion of environmental factors in Section 4.2.3, a connection to either of the Gulfstream pipelines would be preferable to constructing another pipeline to shore. **The feasibility of using an existing pipeline should be examined.**

Horizontal Directional Drill (HDD) is mentioned for landfall pipeline installation with the preferred project. **Since the HDD technology is rapidly evolving, the potential of employing this technique far more extensively than is presently proposed should be discussed.**

As regards the various onshore pipeline alternatives, it was mentioned that engineering constraints (for gas flow) make using the Gulfstream Line #10 unacceptable. **Additional explanation of these constraints would be helpful**.

The co-generation vaporization (CV) alternative was eliminated from further detailed consideration without adequate explanation. **A more detailed rationale for why this alternative was eliminated should be given.**

Subject matter contact: Mr. Ted Bisterfeld 404 562-9621